

IN THE CLAIMS

1. (withdrawn) A system for filtering input data comprising:

a filtering database for storing at least one rule table, said at least one rule table comprising a protocol element locator and a default rule; and

a data filtering engine coupled to the filtering database for filtering said input data using the at least one rule table in the filtering database.
2. (withdrawn) The system for filtering input data in claim 1 wherein the filtering database comprises layered tables of rule tables.
3. (withdrawn) The system for filtering input data in claim 1 wherein the default rule comprises a statistics counter.
4. (withdrawn) The system for filtering input data in claim 1 wherein the at least one rule table further comprises at least one filtering rule.
5. (withdrawn) The system for filtering input data in claim 4 wherein the at least one filtering rule comprises a statistics counter.
6. (withdrawn) The system for filtering input data in claim 1 wherein the data element locator comprises an offset and a mask for selecting a data element of the input data.
7. (withdrawn) The system for filtering input data in claim 1 wherein the data element locator further comprises a table timer.
8. (withdrawn) The system for filtering input data in claim 1 wherein the data filtering engine further comprises:

a data buffer for storing the input data;

a data element locator buffer for storing the data element locator; and

a rule evaluator for receiving the input data from the data buffer and applying the at least one rule table to the input data.

9. (withdrawn) A system for filtering input data comprising:

a filtering database comprising layered rule tables, each rule table comprising a data element locator and a default rule; and

a data filtering engine coupled to the filtering database for filtering said input data using the layered rule tables in the filtering database.

10. (withdrawn) The system for filtering input data in claim 9 wherein each rule table further comprises at least one filtering rule.

11. (withdrawn) The system for filtering input data in claim 11 wherein the at least one filtering rule comprises a statistics counter.

12. (withdrawn) The system for filtering input data in claim 9 wherein the data element locator comprises an offset and a mask for selecting a data element from the input data.

13. (withdrawn) The system for filtering input data in claim 9 wherein the data filtering engine further comprises:

a data buffer for storing the input data;

a data element locator buffer for storing the data element locator; and

a rule evaluator for receiving the data from the data buffer and applying the at least one rule table to the input data.

14. (withdrawn) The system for filtering input data in claim 13 wherein the rule evaluator uses the data element locator to select a data element from the input data.

15. (withdrawn) A system for filtering input data comprising:

a data buffer for storing the input data;

a data element locator for indicating a data element in the input data;
at least one rule table for storing the data element locator and at least one rule to be applied to the data element from the input data and for applying the at least one rule table to the data element.

16. (withdrawn) The system for filtering input data in claim 15 wherein the at least one rule table comprises at least one filtering rule and at least one default rule to be applied to the data element indicated by the data element locator.

17. (withdrawn) The system for filtering input data in claim 16 wherein the at least one filtering rule and the at least one default rule comprise a statistics counter.

18. (withdrawn) The system for filtering input data in claim 15 further comprising:
a filtering database for storing the at least one rule table as layered tables of rules.

19. (withdrawn) A system for filtering input data comprising:
a data buffer for storing the input data;
a data element locator for indicating a data element in the input data;
a filtering database comprising layered tables of rule, each rule table comprising the data element locator and at least one rule to be applied to the data element in the input data; and
a rule evaluator having a first input coupled to the data buffer for using the data element locator to determine the data element from the input data and for applying the at least one rule table to the data element.

20. (withdrawn) The system for filtering input data in claim 19 wherein each rule table comprises at least one filtering rule and at least one default rule to be applied to the data element indicated by the data element locator.

21. (withdrawn) A method for filtering input data comprising at least one data element in a system comprising a filtering database, wherein the filtering database comprises at least one rule table, said at least one rule table comprising a data element locator and a default rule, the method comprising the steps of:

selecting the data element from the input data;

comparing the selected data element to an upper bound of the filtering rule; and

comparing the selected data element to a lower bound of the filtering rule.

22. (withdrawn) The method of claim 21 wherein the step of selecting the data element further comprises the substeps of:

obtaining the data element locator from the rule table in the filtering database; and

applying the data element locator to the input data to select the data element from the input data.

23. (withdrawn) The method of claim 21 wherein the step of comparing the selected data element to an upper bound of the filtering rule comprises the substep of:

determining whether the selected data element is less than or equal to the upper bound.

24. (withdrawn) The method of claim 21 wherein the step of comparing the selected data element to a lower bound of the filtering rule comprises the substep of:

determining whether the selected data element is less than or equal to the lower bound.

25. (withdrawn) A method for filtering input data in a system comprising a filtering database containing layered tables of rule tables, the method comprising the steps of:

selecting a data element from the input data;

accessing a rule table in said layered tables of rule tables corresponding to the selected data element; said rule table comprising at least one filtering rule; and

applying the at least one filtering rule to the selected data element.

26. (withdrawn) The method of claim 25 wherein the step of selecting a data element further comprises the substeps of:

obtaining a data element locator from the rule table in the filtering database; and

applying the data element locator to the input data to select the data element from the input data.

27. (withdrawn) The method of claim 25 wherein the step of applying the at least one filtering rule comprises the substep of:

determining whether the selected data element is less than or equal to an upper bound.

28. (withdrawn) The method of claim 25 wherein the step of applying the at least one filtering rule comprises the substep of:

determining whether the selected data element is less than or equal to a lower bound.

29. (currently amended) A system for filtering packets comprising:

a filtering database ~~for storing at least one rule table~~ comprising layered rule tables, ~~said at least one wherein each rule table comprising~~ comprises a protocol element locator and a default rule; and

a packet filtering engine coupled to the filtering database for filtering said packets using the at least one rule table in the filtering database.

30. (canceled)

31. (currently amended) The system for filtering packets in claim 29 wherein ~~the at least one~~ each rule table further comprises at least one filtering rule.

32. (original) The system for filtering packets in claim 31 wherein the at least one filtering rule comprises a statistics counter.

33. (currently amended) The system for filtering packets in claim 29 wherein the protocol element locator comprises an offset and a mask for selecting a protocol element of ~~the~~ a packet.

34. (original) The system for filtering packets in claim 29 wherein the protocol element locator further comprises a table timer and statistics counters.

35. (currently amended) The system for filtering packets in claim 29 wherein the packet filtering engine further comprises:

a packet buffer for storing packets;

a protocol element locator buffer for storing the protocol element locator; and

a rule evaluator for receiving ~~the~~ a packet from the packet buffer and applying ~~the~~ at least one rule table to the packet.

36 (original) The system of claim 29 wherein the packet filtering engine is coupled to receive a packet prototype modifying the filtering database.

37. (original) A system for filtering packets comprising:

a filtering database comprising a plurality of layered rule tables, each rule table comprising a protocol element locator and a default rule; and

a packet filtering engine coupled to the filtering database for filtering said packets using the layered rule tables in the filtering database,

wherein the system is coupled to receive a packet prototype for determining a location to be modified in the filtering database.

38. (original) The system for filtering packets in claim 37 wherein each rule table further comprises at least one filtering rule.

39. (original) The system for filtering packets in claim 37 wherein the at least one filtering rule comprises a statistics counter.

40. (currently amended) The system for filtering packets in claim 37 wherein the protocol element locator comprises an offset and a mask for selecting a protocol element from ~~the~~ a packet.
41. (currently amended) The system for filtering packets in claim 37 wherein the packet filtering engine further comprises:
- a packet buffer for storing packets;
 - a protocol element locator buffer for storing the protocol element locator; and
 - a rule evaluator for receiving ~~the~~ a packet from the packet buffer and applying ~~the~~ at least one rule table to the packet.
42. (currently amended) The system for filtering packets in claim 37 wherein the rule evaluator uses the protocol element locator to select a protocol element from ~~the~~ a packet.
43. (canceled)
44. (canceled)
45. (canceled)
46. (canceled)
47. (currently amended) A system for filtering packets comprising:
- a packet buffer for storing packets;
 - a protocol element locator for indicating a protocol element in ~~the~~ a packet;
 - a filtering database comprising layered tables of rules, each rule table comprising the protocol element locator and at least one rule to be applied to the protocol element in the packet;
- and

a rule evaluator having a first input coupled to the packet buffer for using the protocol element locator to determine ~~the~~ a protocol element from the packet and for applying ~~the~~ at least one rule table to the protocol element.

48. (original) The system for filtering packets in claim 47 wherein each rule table comprises at least one filtering rule and at least one default rule to be applied to the protocol element indicated by the protocol element locator.

49. (original) The system for filtering packets in claim 47 further comprising a processor interface for receiving a packet prototype, said packet prototype to be used in modifying the filtering database.

50. (canceled)

51. (canceled)

52. (canceled)

53. (canceled)

54. (canceled)

55. (currently amended) A method for filtering packets in a system comprising a filtering database containing layered tables of rule tables, the method comprising the steps of:

selecting a protocol element from ~~the input data~~ a packet;

accessing a rule table in said layered tables of rule tables corresponding to the selected protocol element; said rule table comprising at least one filtering rule; and

applying the at least one filtering rule to the selected protocol element.

56. (original) The method of claim 55 wherein the step of selecting a protocol element further comprises the substeps of:

obtaining a protocol element locator from the rule table in the filtering database; and

applying the protocol element locator to the packet to select the protocol element from the packet..

57. (original) The method of claim 55 wherein the step of applying the at least one filtering rule comprises the substep of:

determining whether the selected protocol element is less than or equal to an upper bound.

58. (original) The method of claim 55 wherein the step of applying the at least one filtering rule comprises the substep of:

determining whether the selected protocol element is great than or equal to a lower bound.

59. (original) The method of claim 55 further comprising the step of receiving a packet prototype for modifying the filtering database.

60. (currently amended) A system for filtering packets in parallel comprising:

a packet data interface, for receiving a packet; and

a parallel filtering database coupled to the packet data interface, the parallel filtering database ~~comprising a parallel filtering database entry~~ for evaluating rules in a single rule table in parallel.

61. (original) The system in claim 60 wherein the filtering database further comprise:

at least one Table ID-Content Addressable Memory (CAM);

a Filtering rule storage; and

an Associated Data.

62. (original) The system of claim 60 wherein the system is coupled to receive a packet prototype for modifying the parallel filtering database.

63. (currently amended) A system for modifying a filtering database comprising:
a packet prototype for determining a location to be modified in the filtering database, and
a filtering engine for receiving the packet prototype from an external software source and
for modifying the location determined by the packet prototype.

64. (original) The system of claim 63 wherein the packet prototype comprises:
at least one protocol element descriptor having an upper bound and a lower bound,
wherein said lower bound and said upper bound are used to point to a location in the filtering
database.

65. (canceled)

66. (canceled)

67. (canceled)

68. (canceled)

69. (canceled)

70. (canceled)

71. (canceled)

72. (new) An apparatus for filtering packets comprising:
a protocol element locator to select one of a plurality of protocol elements from a packet;
a plurality of rule tables, each rule table corresponding to a protocol element; and
a default rule and a filtering action for each rule table;

73. (new) The apparatus of claim 72 wherein each rule table further comprises at least one
filtering rule.

74. (new) The apparatus of claim 73 wherein the filtering rule comprises a pointer to another
rule table.

75. (new) The apparatus of claim 73 wherein the filtering rule comprises a statistics counter.
76. (new) The apparatus of claim 72 wherein the protocol element locator specifies an offset and a mask for selecting a protocol element from a packet.
77. (new) A system for filtering packets comprising:
- a static storage device;
 - a filtering database comprising a protocol element locator for selecting one of a plurality of protocol elements from a packet, a plurality of rule tables, wherein each rule table has a corresponding protocol element and a default rule; and
 - a packet filtering engine coupled to the filtering database, the filtering engine to filter packets using the rule table.
78. (new) The system of claim 77 wherein the filtering database further comprises at least one filtering rule for each rule table.
79. (new) The system of claim 77 wherein the filtering rule comprises a pointer to another rule table.
80. (new) The system of claim 78 wherein the filtering rule comprises a statistics counter.
81. (new) The system of claim 77 wherein the protocol element locator comprises an offset and a mask for selecting the protocol element of the packet.
82. (new) The system of claim 77 wherein the protocol element locator further comprises a table timer and statistics counters.
83. (new) The system of claim 77 wherein the filtering engine further comprises:
- a packet buffer for storing packets;
 - a protocol element locator buffer for storing the protocol element locator; and

a rule evaluator for receiving the packet from the packet buffer and applying at least rule table to the packet.